

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
20 December 2001 (20.12.2001)

PCT

(10) International Publication Number
WO 01/96419 A3

- (51) International Patent Classification⁷: C08F 10/02, 210/02, B65D 53/06
- (21) International Application Number: PCT/GB01/02650
- (22) International Filing Date: 14 June 2001 (14.06.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0014547.4 14 June 2000 (14.06.2000) GB
- (71) Applicant (*for all designated States except US*): BOREALIS TECHNOLOGY OY [FI/FI]; P.O. Box 330, FIN-06101 Porvoo (FI).
- (71) Applicant (*for GB only*): GOLDING, Louise [GB/GB]; c/o 179 Queen Victoria Street, London EC4V 4EL (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): BAANN, Hege, Vale [NO/NO]; Planetveien 34, N-3942 Skjelsvik (NO). LINDAHL, Ann, Kristin [NO/NO]; Skienstgate 32, N-3912 Porsgrunn (NO).
- (74) Agents: GOLDING, Louise et al.; Frank B. Dehn & Co., 179 Queen Victoria Street, London EC4V 4EL (GB).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EC, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 25 April 2002
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: INJECTION MOULDING POLYMER

(57) Abstract: The invention relates to the use of an LLDPE produced using a single site catalyst, e.g. an LLDPE produced using a metallocene (m-LLDPE), in injection moulding of food packaging material, especially closures for food containers. Such materials have been found to exhibit low levels of migration, typically less than 40 mg/dm², e.g. less than 5 mg/dm², and are particularly suitable for use in packaging foods having a high fat content.

WO 01/96419 A3

IN NATIONAL SEARCH REPORT

International Application No

PCT/GB 01/02650

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F10/02 C08F210/02 B65D53/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08F B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 424 243 A (NISHIMOTO YOSHIHARU ET AL) 3 January 1984 (1984-01-03) column 2, line 39 -column 2, line 43; examples 1,7	
X	US 5 929 128 A (GREENE EDWARD E ET AL) 27 July 1999 (1999-07-27) the whole document	1-11, 19-24
A	US 5 026 798 A (CANICH JO ANN MARIE) 25 June 1991 (1991-06-25) the whole document	2,7
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

A document member of the same patent family

Date of the actual completion of the international search

4 February 2002

Date of mailing of the international search report

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Van Golde, L

IN INATIONAL SEARCH REPORT

International Application No

PCT/GB 01/02650

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 11, 30 September 1998 (1998-09-30) & JP 10 147370 A (TOPPAN PRINTING CO LTD), 2 June 1998 (1998-06-02) abstract ----	1
X	WO 98 46409 A (JACOBS IAN ORDE MICHAEL) 22 October 1998 (1998-10-22) page 3, line 4 -page 3, line 17 -----	6-9
X	US 5 925 430 A (MIERZWIAK JAMES G ET AL) 20 July 1999 (1999-07-20) the whole document -----	19-24

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 01/02650

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
1-11, 19-24
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-11

Use of an LLDPE prepared using a single site catalyst in injection moulding of food packaging material.

2. Claims: 12-18

LLDPE suitable for use in injection moulding having a migration level of 40 mg/square dm.

3. Claims: 19-24

A closure for a food container formed from an LLDPE.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/02650

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4424243	A	03-01-1984	JP 1576889 C	24-08-1990
			JP 57039957 A	05-03-1982
			JP 61000184 B	07-01-1986
			JP 1507652 C	26-07-1989
			JP 56089945 A	21-07-1981
			JP 61001295 B	16-01-1986
			AU 533613 B2	01-12-1983
			AU 6559980 A	16-07-1981
			DE 3064167 D1	18-08-1983
			DK 539480 A ,B,	26-06-1981
			EP 0032027 A2	15-07-1981
US 5929128	A	27-07-1999	US 5849418 A	15-12-1998
			US 5723507 A	03-03-1998
			AU 3970397 A	25-02-1998
			WO 9805731 A1	12-02-1998
			US 6235822 B1	22-05-2001
			AT 204890 T	15-09-2001
			AU 711738 B2	21-10-1999
			AU 1969097 A	01-10-1997
			BR 9708001 A	27-07-1999
			CA 2245735 A1	18-09-1997
			CN 1213390 A ,B	07-04-1999
			DE 69706409 D1	04-10-2001
			EP 0891390 A1	20-01-1999
			ES 2159845 T3	16-10-2001
			JP 2000506820 T	06-06-2000
			NO 984155 A	10-09-1998
			TR 9801808 T2	21-12-1998
			WO 9733935 A1	18-09-1997
			AT 164876 T	15-04-1998
			CA 2169177 A1	23-02-1995
			DE 69409530 D1	14-05-1998
			DE 69409530 T2	06-08-1998
			EP 0714426 A1	05-06-1996
			ES 2114221 T3	16-05-1998
			FI 960719 A	15-04-1996
			JP 9501720 T	18-02-1997
			WO 9505426 A1	23-02-1995
			AT 181351 T	15-07-1999
			CA 2169067 A1	23-02-1995
			DE 69419160 D1	22-07-1999
			DE 69419160 T2	14-10-1999
			DE 714427 T1	28-11-1996
			EP 0714427 A1	05-06-1996
			ES 2089990 T1	16-10-1996
			FI 960720 A	16-02-1996
			GR 96300043 T1	31-08-1996
			GR 3030440 T3	30-09-1999
			JP 9501721 T	18-02-1997
			WO 9505427 A1	23-02-1995
US 5026798	A	25-06-1991	AT 209662 T	15-12-2001
			AU 667292 B2	21-03-1996
			AU 8754291 A	15-04-1992
			BR 9106842 A	20-07-1993
			CA 2090872 A1	14-03-1992
			DE 69132836 D1	10-01-2002

IN :NATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 01/02650

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5026798	A	EP 0548277 A1	30-06-1993
		JP 6505033 T	09-06-1994
		WO 9205204 A1	02-04-1992
		US 5420217 A	30-05-1995
		US 5504169 A	02-04-1996
		US 5723560 A	03-03-1998
		AT 141275 T	15-08-1996
		AT 151429 T	15-04-1997
		AU 6248390 A	21-03-1991
		AU 643237 B2	11-11-1993
		AU 6443990 A	18-04-1991
		BR 9004537 A	10-09-1991
		BR 9007642 A	21-07-1992
		CA 2024899 A1	14-03-1991
		CA 2065745 A1	14-03-1991
		DD 343767 B1	07-05-1992
		DE 69028057 D1	19-09-1996
		DE 69028057 T3	25-01-2001
		DE 69030442 D1	15-05-1997
		DE 420436 T1	15-02-1996
		DE 662484 T1	27-06-1996
		DK 420436 T3	02-12-1996
		DK 491842 T3	27-10-1997
		EP 0420436 A1	03-04-1991
		EP 0491842 A1	01-07-1992
		EP 0662484 A2	12-07-1995
		EP 0671404 A2	13-09-1995
		EP 0643066 A2	15-03-1995
		ES 2091801 T3	16-11-1996
		ES 2079332 T1	16-01-1996
		GR 3021539 T3	28-02-1997
		GR 3034632 T3	31-01-2001
		HU 55791 A2	28-06-1991
		IL 119415 A	01-06-2000
		JP 3188092 A	16-08-1991
		JP 2994746 B2	27-12-1999
		KR 190735 B1	01-06-1999
		KR 195662 B1	15-06-1999
		NO 178891 B	18-03-1996
JP 10147370	A	02-06-1998	NONE
WO 9846409	A	22-10-1998	AU 6814498 A 11-11-1998
			WO 9846409 A1 22-10-1998
			EP 0981431 A1 01-03-2000
			HU 0102647 A2 28-12-2001
			TW 397757 B 11-07-2000
			ZA 9803104 A 30-10-1998
US 5925430	A	20-07-1999	NONE